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A Descriptive Study to Assess the Knowledge of Staff Nurses Regarding Potassium Imbalance Among Children in Child Health Care Areas of Selected Hospital, Ludhiana, Punjab

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ABSTRACT

Potassium imbalance is frequently encountered in children. Specially, mortality rates are significantly higher in hypokalemia in wide range of disorders in children. India accounts for 25% of global child death, in that 18% of children die due to electrolyte imbalance, mainly including potassium and sodium imbalance. In Punjab, under five mortality rate due to potassium imbalance is 23%. A descriptive study was conducted to assess the knowledge of staff nurses regarding potassium imbalance among children in child health care areas of selected hospital, Ludhiana, Punjab. Aim of the study was to assess knowledge of staff nurses regarding potassium imbalance among children. The objectives were to assess the level of knowledge of staff nurses regarding potassium imbalance among children, to assess the relationship of knowledge of staff nurses with selected variables, to identify the deficits in the areas of knowledge of staff nurses regarding potassium imbalance and conduct teaching for staff nurses. Conceptual framework was based on Three Phase Learning Theory by Paul Fitts and Michael Posner, 1967. A quantitative research approach and non- experimental descriptive design was adopted for the study. Study was conducted in child health care areas of CMC & Hospital, Ludhiana. Data was collected by structured knowledge questionnaire tool which was tested to be reliable (r=0.87). The collected data from 100 staff nurses was organized, analyzed, tabulated and interpreted using descriptive and inferential statistics. According to level of knowledge of staff nurses, maximum staff nurses (45%) had an average level of knowledge and only 4% staff nurses had excellent level of knowledge. Professional qualification and current area of work had an impact on the level of knowledge of staff nurses (at $p<0.05$). It was inferred that staff nurses had maximum deficits were in the introduction related to potassium and its imbalance and minimum was in hypokalemia. The overall mean knowledge score was less than the expected level, therefore, the researcher planned & conducted a teaching for staff nurses working in child health care areas of Christian Medical College & Hospital, Ludhiana, Punjab.

Keywords: Knowledge, Staff nurses, Potassium Imbalance, Child Health Care Areas.

INTRODUCTION

Potassium is the most abundant intracellular cation electrolyte in the body with only approximately 2% of total body stores present in the extracellular space. Potassium is necessary for maintaining a normal charge difference

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between intracellular and extracellular environments. Derangements of potassium regulation may lead to neuromuscular, GI, and cardiac conduction abnormalities. The high incidence of abnormalities in serum potassium concentration reflects both physiologic and developmental abnormalities that are common in critically ill children. **(Dutta AK, Sachdeva A, 2012)[1]**. Potassium imbalance is much more common in newborn babies and children. It includes excess of potassium in blood called hyperkalemia that is serum potassium >5.4 mEq/L and decreased level of potassium in blood called hypokalemia that is serum potassium <3.5mEq/L. The change in serum potassium concentration associated with changes in serum pH will always be in the direction opposite the changes in Ph. **(Hazinski Fran M, 2013)[2].** In a hospital report, more than 1 million cases of hypokalemia is reported each year in children. All over the world more than 6 million children are dying each year due to neglect of nurses or overdose of potassium chloride. **(Neville N 2010)[3]**. India accounts for 25% of global child death, in that 18% of children dies due to electrolyte imbalance, mainly including potassium and sodium imbalance. In Punjab, under five mortality rate due to potassium imbalance is 23%. **(IAP, 2010)[4]**. Health department of England published a hospitalization statistics of diarrhea among children that occurred between the year 2015-2016. During this period, 1084 children admitted in the University hospital of England. 84% of children with diarrhea have hypokalemia and required hospital admission. They were put on potassium therapy during hospitalization. **(Kenagy JW, Clausen TG 2015)[5]**. A study was conducted in Ontario to determine the knowledge level of nurses about high-risk medications, and 31.8% did not know that 15% potassium chloride solution should never be administered as intravenous bolus. Deaths concerning administration errors of intravenous potassium are highly debated in case studies on the subject, since medications with similar-sounding names, shaping, color of the ampule etc. can be confused with potassium. **(Mevin, 2013)[6]**.

MATERIAL AND METHODS

For the present study, non-experimental research design and quantitative research approach was used. The study was conducted on staff nurses working in child health care areas of Christian Medical College and Hospital, Ludhiana, Punjab. The sample was collected from 100 registered staff nurses working in pediatric medical ward, pediatric surgical ward, PICU, neuro-surgery ward, neuro surgery ward, pediatric OPD, trauma unit and BMT unit in Christian Medical College and Hospital, Ludhiana, Punjab. The sample was selected by non probability purposive sampling technique. Confidentiality was maintained along with informed consent. Male and female staff nurses available at the time of data collection and willing to participate in the study were included whereas who were not willing and not present at the time of data collection were excluded.

DATA COLLECTION

For data collection, the researcher developed a structured questionnaire for knowledge assessment of staff nurses. An intensive review of the literature, experts' opinion, suggestions of the research panel, researchers' professional experience provided basis for the construction of knowledge questionnaire. Structured knowledge questionnaire consisted of two parts: part I demographic data which consisted 7 items that is age, gender, professional qualification, professional experience in pediatric area, current working area, training institute and source of information related to potassium imbalance. Part II comprised of knowledge related questions on potassium imbalance. The structured questionnaire consisted of 48 multiple choice items. Each item consisted of one correct answer among the four choices. Content validity of tool was established by the expert's opinion on the relevance of items. The tool was circulated among 10 experts, five professors(from Pediatric nursing, Medical Surgical nursing, Obstetrics and Gynaecological nursing), three

associate professors(from Medical Surgical Nursing and Pediatric nursing), one assistant professor(from Pediatric nursing) and two doctors(from Pediatric medical and surgical units). Reliability was tested and confirmed by split half method using Karl Spearman's Brown Prophecy formula of reliability. It was computed by using Karl Pearson's coefficient of correlation. The reliability of knowledge questionnaire was **r=0.87.** Hence the tool was found to be reliable. After getting approval from research committee, permission was taken from Nursing Sperintendent. The data was collected by researcher in each shift. The time taken to collect data was 60 minutes from each staff nurse.

DATA ANALYSIS

The data was analyzed by using descriptive statistics (mean, mean percentage, standard deviation) and inferential statistics (ANOVA test, Z test. t test). The tables were used to present the data. Pie and bar diagrams were used to depicts the findings. The level of significance chosen was $p<0.05$. The SPSS software was used.

FINDINGS

A total of 100 staff nurses were included in the study. Findings related to demographic variables were maximum number of staff nurses having knowledge were in the age group more than 38years (32%), 77% were females, 53% did GNM, 33% had >9 years of total professional experience in pediatric areas, 33% were working in pediatric ward, 75% had studied in College of nursing, Christian Medical College and Hospital, Ludhiana, Punjab and 51% got information related to potassium imbalance among children through classroom/ward teachings. Findings related to knowledge of staff nurses regarding potassium imbalance among children were maximum staff nurses (45%) had an average level of knowledge and only 4% had excellent level of knowledge. Findings related to relationship of knowledge of staff nurses with selected variables that the mean knowledge score was highest (27.28) in staff nurses in between age group of 32-37 years and least (25.24) in age group of 21-27 years. The mean knowledge score was highest (26.43) in females and least (26.13) in males. Nurses who did Post Basic B.Sc nursing had highest (29.09) knowledge score and least (23.88) in staff nurses who had done Basic B.Sc nursing. The difference in the mean knowledge score was found to be statistically significant at $p<0.05$ level of significance. The score was highest (27.15) among staff nursing who were having experience>9years and least (24.46) among staff nurses with experience 2-5 years. The mean score was highest (32.08) among the staff nurses working in trauma unit and least (22.57) among staff nurses who were working in BMT unit. The difference in the mean knowledge score was found to be statistically significant at $p<0.05$ level of significance. The mean knowledge score was highest (28.25) in staff nurses who got information from mass media/internet and least (25.53) from nursing journals/magazines. The areas of knowledge were divided into Introduction, Hyperkalemia, Hypokalemia & nursing responsibilities related to potassium imbalance in children. The maximum number of deficit in Introduction was (76%) and minimum deficit was 7%. The maximum number of deficit in Hyperkalemia was management of hyperkalemia (66%) and minimum deficit was 23%. The maximum number of deficit in Hypokalemia was (69%) and minimum deficit was 21%. The maximum number of deficit in nursing responsibilities was (70%)

Table 1: Frequency & Percentage Distribution of Staff nurses according to level of knowledge regarding Potassium Imbalance among Children

N=100

		Staff nurses	
Level of knowledge	*Score*	*n*	*%*
Excellent	>38	04	04
Good	32-38	13	13
Average	25-31	45	45
Below average	<25	38	38

Maximum Score=48 Minimum score=0

Table 2: Analysis of Variance of knowledge score of staff nurses regarding potassium imbalance among children according to professional qualification

N=100

Professional qualification	*n*	*Knowledge Score*		
		Mean	*SD*	
GNM	53	26.15		5.10
Basic B.Sc nursing	24	23.88		6.19
Post basic B.Sc Nursing	23	29.09		6.78
Sources of variables	*df*	*Sum of square*	*Mean sum of squares*	*F*
Between groups	02	320.92	160.46	4.8*
Within groups	97	3245.24	33.46	
Total	99	3566.16		

Maximum Score= 48 *Significant at p<0.05 level Minimum Score=00

Table 3: Mean, Standard Deviation and 't' test of Knowledge score of staff nurses regarding potassium imbalance among children according to professional qualification N=100

Professional qualification	*n*	*Knowledge Score*	
		Mean	*SD*
GNM	53	26.15	5.10
Basic B.Sc nursing	24	23.88	6.19
Post basic B.Sc Nursing	23	29.09	6.78
		df	*t*
	(a & b)	75	**1.69**^{NS}
	(a & c)	74	**2.08***
	(b & c)	45	**2.76***

Maximum Score= 48 NS= Non Significant at p<0.05 level

Minimum Score=00 *Significant at p<0.05 level

Table 4: Analysis of Variance of knowledge score of staff nurses regarding potassium imbalance among children according to current working area N=100

Current Working Area	*n*	*Knowledge Score*		
		Mean		*SD*
a. Pediatric ward (medical/surgical)	53	24.33		5.41
b. NICU/PICU	24	29.96		6.16
c. Trauma unit	23	32.08		20.99
d. BMT unit	07	22.57		5.16
e. Other units	19	25.42		5.00
Sources of variables Between groups	*df*	*Sum of square of*	*Mean sum squares*	***F***
Within groups	04	1000.43	250.11	3.02*
Total	95	7863.57	82.77	
	99	8864.00		

Maximum Score= 48 *Significant at p<0.05 level Minimum Score=00

Table 5: Mean, Standard Deviation and 't' test of Knowledge score of staff nurses regarding potassium imbalance among children according to current working area N=100

		Knowledge Score	
Professional qualification	*n*	*Mean*	*SD*
Pediatric ward (medical/surgical)	53	24.33	5.41
NICU/PICU			
Trauma unit	24	29.96	6.16
BMT unit	23	32.08	20.99
Other units	07	22.57	5.16
	19	25.42	5.00
		df	*t*
	(a & b)	59	3.77*
	(a & c)	44	**1.02**^{NS}
	(a & d)	38	**0.79**^{NS}
	(a & e)	50	**0.69**^{NS}
	(b & c)	39	**1.95**^{NS}
	(b & d)	33	**2.91***
	(b & e)	45	**2.67***
	(c & d)	18	**1.50**^{NS}
	(c & e)	30	**0.41**^{NS}
	(d & e)	24	**1.28**^{NS}

Maximum Score= 48 NS= Non Significant at p<0.05 level
Minimum Score=00 *Significant at p<0.05 level

and minimum deficit was 5%. It was inferred that overall minimum deficit were in the area of introduction and maximum deficits were in the area of hypokalemia From above major findings it was concluded that majority of staff nurses lack expected level of knowledge regarding potassium imbalance. The findings also supports the need to conduct teaching regarding potassium imbalance.

DISCUSSION

The data analysis revealed that maximum staff nurses (45%) had an average level of knowledge and only 4% had excellent level of knowledge regarding potassium imbalance in children. these findings were supported by Athulya A. (2011)7 who reported that 93.3% of samples had average level of knowledge regarding hyperkalemia and its management. In another study conducted by Hsaio et al (2010)8 it was found that 31.8% of participating nurses did not know that they should not never administer potassium chloride as intravenous bolus. According to professional qualification, the mean knowledge was highest (29.09) in staff nurses who did Post Basic B.Sc nursing, followed by 26.15 among staff nurses who had done GNM and least (23.88) in Basic B.Sc nursing. The difference in mean interpretation score was found statistically significant, so further 't' value was calculated. The significant difference was found among staff nurses who did GNM and Post Basic B.Sc nursing. Hence it can be inferred that professional qualification had an impact on the knowledge of staff nurses. These interpretations were contradictory with the study by Gunes A. Celik SS (2014)9 who stated that there was no statistically significant relation between practices scores and level of education. According to current working area, the mean knowledge score was highest (32.08) among staff nurses working in trauma unit followed by 29.96 working in NICU/PICU,

25.42 in other units, 24.33 in pediatric ward and least (22.57) among BMT staff nurses. The difference in mean knowledge was found statistically significant, so further 't' value was calculated. The significant difference was found significant among staff nurses of pediatric wards & NICU/PICU, followed by staff nurses from NICU/PICU & BMT and staff nurses in NICU/PICU & other units. Hence it can be inferred that current area of work had an impact on the knowledge of staff nurses regarding potassium imbalances among children. these findings were contradicted by Vijayan A (2011)10 who revealed that there was no significant relation between the area of work and the knowledge of the samples. According to deficit areas of knowledge, the maximum deficit in introduction related to potassium and potassium imbalance was (76%), in hyperkalemia the maximum deficit was (66%), in hypokalemia the maximum deficit was (69%) and in areas of nursing responsibilities related to potassium imbalance was (70%). These findings were supported by Bahta S, Haile B (2014)11 who conducted a study to assess nurses knowledge on potassium loss. The findings demonstrated that GI unit nurses were able to identify the problem but could not name it. So the study recommended that practice teaching to enhance their knowledge.

CONCLUSION

On the basis of research findings it can be concluded that most of the staff nurses working in various child health care areas of CMC & Hospital, Ludhiana had an average level of knowledge regarding potassium imbalance in children. There was statistically significant impact of professional qualification and current area of work on the knowledge of staff nurses. The overall mean knowledge score was less than the expected level, which call for the attention of nursing administrators or educators for conducting teaching programme for staff nurses. Therefore, investigator decided to plan teaching for nurses posted in child health care areas.

CONFLICT OF INTEREST: there were no conflicts of interest

SOURCE OF FUNDING: This study is self funded

ETHICAL CLEARANCE: Prior to data collection, formal written permission was taken from research and ethical committee, college of nursing, Christian Medical & Hospital, Ludhiana Punjab. After that, permission was taken from NS of Christian Medical & Hospital. Anonymity of the subjects and confidentiality of information was maintained. They were assured that their responses would be kept confidential and used only for research purpose.

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